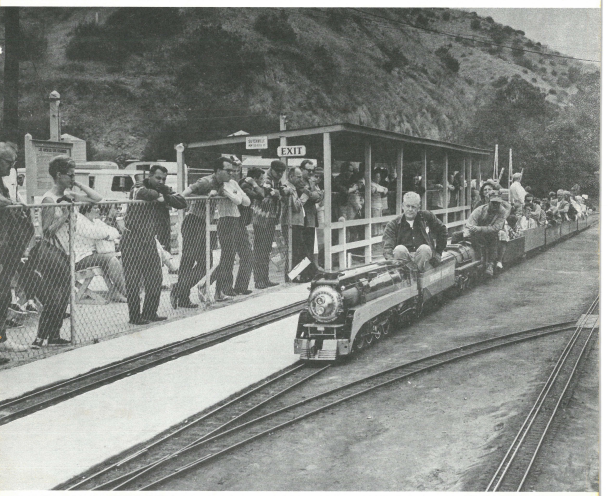
FEBRUARY 1968

45¢

Live Steam®



2nd Annual Live Steam Club Survey

Live Steam Club Directory

Live Steam
magazine

FEBRUARY 1968 VOL. 2 NO. 2

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LIVE STEAM CLUB SURVEY

by Stephen Vitkovits
New Jersey Live Steamers

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It is interesting to note the following: 8 of the clubs listed were founded in 1967 as compared to 5 clubs founded in 1966; 8 of the clubs own their track site; 10 groups make use of members' private tracks; 5 clubs have their tracks in public parks; 8 groups have a clubhouse; 14 have an annual dinner and 4 clubs give beginner programs.

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710 25th Avenue, North
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3430 West 65th Street
Chicago, Illinois 60629

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Ron Downer
1274 36th Avenue
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GOLETA VALLEY R. R. CLUB, INC.
Seymour F. Johnson
4748 Vieja Drive
Santa Barbara, California 93105

25 regular members. Founded 1955. Facilities: on private property, 5000' 1½" and 700' 3" track, additional 4000' 1½" and 12300' 3" being constructed.

GREAT LAKES LIVE STEAMERS
Eric Corbett
4128 West Point
Dearborn Heights, Michigan 48125

14 regular members. Founded 1953. Facilities: 300' ¾" track.

IOWA MODEL STEAM ENGINEERS, INC.
Pershing Scott
R.F.D. #1
Marion, Iowa 52302

28 regular members. Founded 1955. Facilities: Robins, Iowa, 500' ¾" and 1", 900' 1½" track.

JAMUL VALLEY LIVE STEAMERS CLUB
C. M. Underhill
4675 Coronado Avenue
San Diego, California 92107

7 regular members. Founded 1965. Facilities: 1400' 1½" track on private property.

JOSHUA TREE & SOUTHERN R.R. CLUB
Joel Tedder
4241 East Live Oak Avenue, C. 7
Arcadia, California 91006

3 regular members. Founded 1967. Organizational planning now for 1½" and 3" track and facilities at Joshua Tree, California.

LA PORTE COUNTY HISTORICAL STEAM SOCIETY
Jack Krane
2940 Mount Claire Way, Long Beach
Michigan City, Indiana 46350

LONG ISLAND LIVE STEAMERS
Tom Puhlmann
412 South County Road
East Patchogue, N. Y. 11772

12 regular members. Founded 1966. Now working on track site.

LOS ANGELES LIVE STEAMERS
Ross Crawford
6900 Roger Avenue
Canoga Park, California 91304

205 regular members. Founded 1957. Facilities: Griffity Park, Los Angeles, 700' ¾", 1,100' 1" and 2400' 1½" track. Newspaper: "The Engine Booster"

MICHIGAN STEAM LOCOMOTIVE CLUB

J. Bullock
G–7073 Clio Road
Mt. Morris, Michigan 48458

32 regular members. Founded 1967. No club track at present.

MID-SOUTH LIVE STEAMERS

Joe E. Gaddes
Route 5, Lipscomb Road
Franklin, Tennessee 37064

6 regular members. Founded 1966. Facilities: 500' 15/8" track on private property hot to start club track in spring 1968.

MONTREAL LIVE STEAMERS

S. H. Galloway
53 Brentwood Road
Beaconsfield, Quebec, Canada

14 regular members. Founded 1934. Facilities: 775' 3/4", 850' 1" and 1½" track at new site near Cedars, Quebec. Newspaper: "Roundhouse"

NEW JERSEY LIVE STEAMERS

Ralph Green
865 Kilsyth Road
Elizabeth, New Jersey 07208

52 regular members. Founded 1961. Facilities: Liberty Corner, N. J., 780' 3/4" and 1", 1100' 1½" track. Newspaper: "Whistle Blast"

NORTHERN ILLINOIS LIVE STEAMERS

George "Doc" Youngdahl
1600 South 15th Avenue
Maywood, Illinois 60153

50 regular members. Founded 1967. Group is Live Steam R. R. outgrowth of Chicago Model Engineers Assn. Now locating track site.

OMAHA AREA LIVE STEAMERS

Robert Recic
5022 South 93rd Circle
Omaha, Nebraska 68127

4 regular members. Founded 1967. Facilities: Papillion, Nebraska, 500' 3/4" and 1" track, plan 1½" track in spring 1968.

ONTARIO SUN PARLOR LINE

John Hart
1381 Shepard Street
Windsor, Ontario, Canada

10 regular members. Founded 1961. Facilities: Windsor, Ontario, 650' 1/2", 3/4" and 1" track, presently overhauling for longer service.

PACIFIC NORTHWEST LIVE STEAMERS

Harry Harvey
1425 S. E. Flavel Street
Portland, Oregon 97202

81 regular members. Founded 1963. Facilities: Molalla, Oregon, 2000' 1" and 1½" track. Club now negotiating for the 2 acres that the track is on.

PENNSYLVANIA LIVE STEAMERS

Frank Moore, Jr.
211 Walnut Avenue
Wayne, Pennsylvania 19087

46 regular members. Founded 1946. Facilities: Paoli, Pa., 600' 3/4" and 1", 1880' 1" track. Newspaper: "Newsletter"

PENSACOLA LIVE STEAMERS

Harrison Green
5607 Glass Drive
Pensacola, Florida 32505

New club in process of organization.

PETERBOROUGH LIVE STEAMERS

H. J. McLarnon
269 King George Street
Peterborough, Ontario, Canada

20 regular members. Founded 1962. Facilities: Peterborough, Ont., 300' 3/4" track, looking for site to build track.

PHOENIX LIVE STEAMERS

Donald Barnard
8041 North 12th Avenue
Phoenix, Arizona 85021

12 regular members. Founded 1966. Facilities: various private tracks.

PIONEER VALLEY LIVE STEAMERS

Brenton W. Barnfather
3 Fleetwood Drive
Sandy Hook, Connecticut 06482

89 regular members. Founded 1952. Facilities: Southwick, Mass., 740' 3/4" and 1", 3000' 1½" track.

PUGET SOUND LIVE STEAMERS

Everett R. Arnes
Route 2, Box 330-A
Sedro Woolley, Washington 98284

RAILROADER'S CLUB OF SAN ANTONIO

C. K. Beck
1420 North McCullough Avenue
San Antonio, Texas 78212

12 regular members. Founded 1965. Facilities: 300' 15/8" track

REBEL LIVE STEAM ASSOCIATION

Sydney H. Watts
2532 Hogan Road
East Point, Georgia 30044

10 regular members. Founded 1967. Facilities: East Point, Georgia, 800' 1" track under construction.

RED RIVER VALLEY RAILWAY

Paul Winslow
304–1179 Grant Avenue
Winnipeg, Manitoba, Canada

10 regular members. Founded 1938. Facilities: Winnipeg, Man., 970' 1/2", 3/4" and 1" track. Note: 1" track is 5" gauge.

RIVERSIDE LIVE STEAMERS

Merrill VanNoy
677 Flynn Street
Riverside, California 92507

52 regular members. Founded 1966. Facilities: Hunter Park, Riverside, Calif., 6500' 1½" track, 3000' 1" track under construction.

ROCKY MOUNTAIN LIVE STEAMERS

Art Wegner
3975 Yates Street
Denver, Colorado 80212

10 regular members. Founded 1947. Facilities: 500' 3/4" track on private property.

ST. LOUIS LIVE STEAMERS

Leo Myers
8121 Hazelwood Drive
Clayton, Missouri 63105

10 regular members. Founded 1967. Facilities: various member's tracks.

SAGINAW VALLEY LIVE STEAMERS

Fred Gave
538 Greenbrier Drive, S. E.
Grand Rapids, Michigan

SOUTHEASTERN LIVE STEAMERS

O. A. Rich
1918 Winter Street
Charlotte, North Carolina 28205

9 regular members. Founded 1952. Facilities: Charlotte, N. C., 1800' 3/4" elevated track.

SOUTHERN CALIFORNIA LIVE STEAM CLUB

K. G. Kepner
2764 Maple
Rialto, California 92376

73 regular members. Founded 1948. Facilities: Lomita, California, 800' 3/4" and 1½", 1600' 1" track.

SOUTHERN MINNESOTA LIVE STEAMERS

Richard M. Winkle
220 First Avenue
Rochester, Minnesota 55901

32 regular members. Founded 1960. Facilities: member's private tracks.

TRI-COUNTY LIVE STEAMERS

Albert Cranston
1416 East Santa Ana Street
Anaheim, California 92805

15 regular members. Founded 1952. Members use private tracks. Club is outgrowth of Anaheim Model R. R. Society now interested in all forms of steam power.

UTAH LIVE STEAMERS

Lewis Searle
377 F Street
Salt Lake City, Utah 84103

Now forming. Letters or visits from Live Steam friends are encouraged to support this new activity.

WABASH, FRISCO & PACIFIC ASSOC.

George F. Kessel, Jr.
6347 North Rosebury Avenue
St. Louis, Missouri 63105

26 regular members. Founded 1939. Facilities: 1000' 12" gauge track on private property.

WAUSHAKUM LIVE STEAMERS

Wendell Bishop
52 Pond Street
Natick, Massachusetts

WEST VALLEY LIVE STEAMERS

Dwight Durkee
P. O. Box 21
Cupertino, California 95014

39 regular members. Founded 1963. Informal club made up mostly of GGLS members. Use private 1000' 1½" track.

Old #3 is ready,

AWAITING THE GREEN BOARD

ROBERT CLARKE PHOTOS

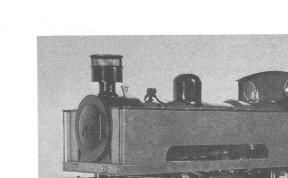
The crew, consisting of Edward Colson and Ralph Grant in the cab, with Gordon Younger (l) and John LePage (r) on the ground with young Donald Wayne Kidd, poses for the photographer at the end of a shake-down run on July 1, 1967.

Great strides have been made towards excursion operation of the City of Winnipeg Hydro's Old #3 in the summer of 1968. All that remains to be done is the lease agreement with the City Council.

About $8,000 will be needed for insurance and supplies and 10,000 Membership Certificates are being printed which will sell for a dollar each. These certificates will be suitable for framing and will be issued by the *Vintage Locomotive Society*, an organization formed and registered by John LePage and Gordon Younger.

Support of this project by the entire Brotherhood of Live Steamers (which, incidentally, includes *all* Live Steamers) would be a worthy endeavor.

Send your dollar now to Vintage Locomotive Society, c/o John LePage, 471 Waverly Street, Winnipeg 9, Manitoba, Canada and share in the preservation and operation of this grand old 1882 locomotive.



a NEW ZEALAND model of a SOUTH AFRICAN locomotive built in ENGLAND

by J. S. Caverhill

The involved title refers to an 1¼" scale model of a two-foot gauge sugar plantation engine built in England by Bagnalls of Stafford for use in a sugar field in South Africa. The model was made from their works drawings. Although it is a scale not much used and usually refers to a model of larger size, the 2½" track gauge brings it back into perspective again. It is of 0–4–0 + 0–4–0 wheel arrangement and each bogie is articulated. The boiler is mounted on a separate frame similar to the Shays and Heislers. Other vital statistics on this locomotive would list the length as 19½", width 8⅝", height 9", wheels 2½" diameter, cylinders (4) 15/16" bore x 1¼" stroke and piston valves ½" diameter.

The boiler is most unusual in that the firebox as well as the barrel is cylindrical. Actually it is a marine type boiler with an internal flue type firebox with the fire bars inside the flue. Through the silver-soldered copper boiler barrel are the usual multi-tube arrangement and two superheater flues. The flue-type firebox means a dry backhead which can be hot on the fingers! The main advantage of this type of construction is a minimum of stays and although some authorities say this type of boiler is not a good steamer, this one has proved satisfactory.

Incidentally, for comparison, the dome is the same diameter as the track gauge.

Coal firing is used and the boiler pressure is 80 pounds per square inch. We have two types of coal available – one a lignite that burns to a fine white ash and the other a partially-processed coal in which the volatile constituents have been driven off but is not coke. Most of the New Zealand coals are bituminous and quickly clog the small fire tubes. I do not know of any oil-fired engines in this country except some full-sized ones.

One of the problems of articulated locomotives is the need for flexible steam pipes. I have found that by generating the spherical parts with a tubular scraper the flexible joints have been very satisfactory. Another point is the linkage from the reversing lever to the valve links which has to be arranged to enable the bogies or trucks to turn without altering the valve rod position in the swinging link.

The boiler feed is by an axle-driven pump in the rear bogie and a hand pump in one side tank. Attempts to build a satisfactory injector have met with no success.

The axle pump on a bogie that turns creates a problem of pressure hoses in a small country such as New Zealand where we do not have a big range of products to draw from. My method for this job was to use neoprene sleeving such as is used on the ends of mineral insulated electric cable. The trade name is "Pyrotenic" and is used in this manner: take a piece of sleeving with a bore of 5/32" and an outside diameter of ¼". Wind a 24-gauge piano wire close-wound spring of such a diameter that the sleeving can just be slid in and cut the spring and sleeving to the same length. Make the fittings with 3/16" – 32 T.P.I. and screw into the assembled spring and sleeve. The wrap of the spring will prevent the fitting from being forced out.

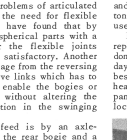
The piston valve bobbins are cast iron in bronze liners. The pistons are aluminum with cast iron rings in bronze cylinders. The bronze cylinders, to simplify pattern making, were cast in two separate pieces and silver soldered together in the center of the bore.

The wheels are cast iron and the motion rods are annealed spring steel. You should try it some time . . . it does not pick up in the file like mild steel. The frames follow English practice and are made of plate correctly riveted and fitted with the cross stretchers as shown on the maker's drawings from which the model was built. All the necessary angle was milled from square steel with a fly cutter in the lathe.

A very handy arrangement on not-so-well-laid tracks is the heavy buffer plate and the angle across near the cylinders. In the event of a derailment, the engine just rests on these and does not foul the track spacers. On the prototype there is only 3" clearance for this purpose.

Nine years were spent building this model and it has now been running seven years. The only replacements have been the cast iron piston valves for the original stainless steel and the installation of cast iron piston rings instead of the graphite yarn used first.

None of the bearings have been replaced although the engine has done much hard work at public track days hauling four and five children besides the driver and trying to keep headway when running in the company of high-wheeled, main line type locomotives!



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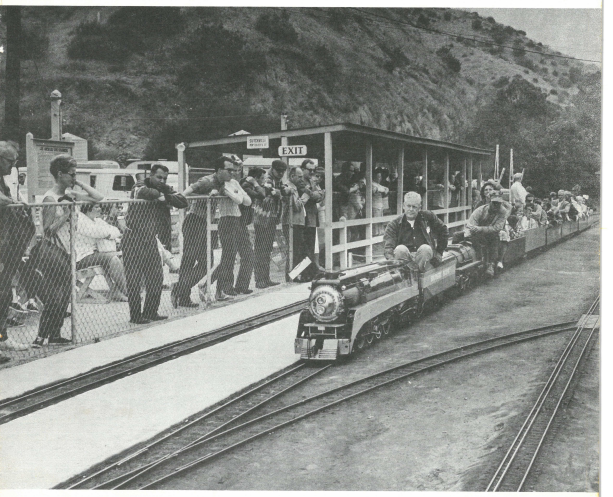

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4748 Vieja Drive
Santa Barbara, California 93105

25 regular members. Founded 1955. Facilities: on private property. 5000' 1½" and 700' 3" track, additional 4000' 1½" and 12300' 3" being constructed.

GREAT LAKES LIVE STEAMERS
Eric Corbett
4128 West Point
Dearborn Heights, Michigan 48125

14 regular members. Founded 1953. Facilities: 300' ¾" track.

IOWA MODEL STEAM ENGINEERS, INC.
Pershing Scott
R.F.D. #1
Marion, Iowa 52302

28 regular members. Founded 1955. Facilities: Robins, Iowa, 500' ¾" and 1", 900' 1½" track.

JAMUL VALLEY LIVE STEAMERS CLUB
C. M. Underhill
4675 Coronado Avenue
San Diego, California 92107

7 regular members. Founded 1965. Facilities: 1400' 1½" track on private property.

JOSHUA TREE & SOUTHERN R.R. CLUB
Joel Tedder
4241 East Live Oak Avenue, C 7
Arcadia, California 91006

3 regular members. Founded 1967. Organizational planning now for 1½" and 3" track and facilities at Joshua Tree, California.

LA PORTE COUNTY HISTORICAL STEAM SOCIETY
Jack Keane
2040 Mount Claire Way, Long Beach
Michigan City, Indiana 46350

LONG ISLAND LIVE STEAMERS
Tom Oversluizen
412 South Country Road
East Patchogue, N. Y. 11772

12 regular members. Founded 1966. Now working on track site.

LOS ANGELES LIVE STEAMERS
Rosa Crawford
6900 Roger Avenue
Canoga Park, California 91304

205 regular members. Founded 1957. Facilities: Griffith Park, Los Angeles, 700' ¾"; 1,100' 1" and 2400' 1½" track. Newspaper: "The Engine Booster"

MICHIGAN STEAM LOCOMOTIVE CLUB

J. Bullock
G–7073 Clio Road
Mt. Morris, Michigan 48458

32 regular members. Founded 1967. No club track at present.

MID-SOUTH LIVE STEAMERS

Joe E. Gaddes
Route 5, Lipscomb Road
Franklin, Tennessee 37064

6 regular members. Founded 1966. Facilities: 500' 1½" track on private property hot to start club track in spring 1968.

MONTREAL LIVE STEAMERS

S. H. Galloway
53 Brentwood Road
Beaconpaire, Quebec, Canada

14 regular members. Founded 1934. Facilities: 775' ¾", 850' 1" and 1½" track at new site near Cedars, Quebec. Newspaper: "Roundhouse"

NEW JERSEY LIVE STEAMERS

Ralph Green
845 Kilsyth Road
Elizabeth, New Jersey 07208

52 regular members. Founded 1961. Facilities: Liberty Corner, N. J., 780' ¾" and 1", 1100' 1½" track. Newspaper: "Whistle Blast"

NORTHERN ILLINOIS LIVE STEAMERS

George "Doc" Youngdahl
1600 South 15th Avenue
Maywood, Illinois 60153

50 regular members. Founded 1967. Group is Live Steam R. R. outgrowth of Chicago Model Engineers Assn. Now locating track site.

OMAHA AREA LIVE STEAMERS

Robert Recic
5022 South 93rd Circle
Omaha, Nebraska 68127

4 regular members. Founded 1967. Facilities: Papillion, Nebraska, 500' ¾" and 1" track, plan 1½" track in spring 1968.

ONTARIO SUN PARLOR LINE

John Hart
1381 Shepard Street
Windsor, Ontario, Canada

10 regular members. Founded 1961. Facilities: Windsor, Ontario, 650' 1½", ¾" and 1" track, presently overhauling for longer service.

PACIFIC NORTHWEST LIVE STEAMERS

Harry Harvey
1425 S. E. Flavel Street
Portland, Oregon 97202

81 regular members. Founded 1963. Facilities: Molalla, Oregon, 2000' 1" and 1½" track. Club now negotiating for the 2 acres that the track is on.

PENNSYLVANIA LIVE STEAMERS

Frank Moore, Jr.
211 Walnut Avenue
Wayne, Pennsylvania 19087

46 regular members. Founded 1946. Facilities: Paoli, Pa., 960' ¾" and 1", 1880' 1" track. Newspaper: "Newsletter"

PENSACOLA LIVE STEAMERS

Harrison Green
5607 Glass Drive
Pensacola, Florida 32505

New club in process of organization.

PETERBOROUGH LIVE STEAMERS

H. J. McLarnon
269 King George Street
Peterborough, Ontario, Canada

20 regular members. Founded 1962. Facilities: Peterborough, Ont., 300' ¾" track, looking for site to build track.

PHOENIX LIVE STEAMERS

Donald Barnard
8041 North 12th Avenue
Phoenix, Arizona 85021

12 regular members. Founded 1966. Facilities: various private tracks.

PIONEER VALLEY LIVE STEAMERS

Brenton W. Barnfather
3 Fleetwood Drive
Sandy Hook, Connecticut 06482

89 regular members. Founded 1952. Facilities: Southwick, Mass., 740' ¾" and 1", 3000' 1½" track.

PUGET SOUND LIVE STEAMERS

Everett K. Ames
Route 2, Box 330-A
Sedro Woolley, Washington 98284

RAILROADER'S CLUB OF SAN ANTONIO

C. K. Beck
1420 North McCullough Avenue
San Antonio, Texas 78212

12 regular members. Founded 1965. Facilities: 300' 1½" track

REBEL LIVE STEAM ASSOCIATION

Sydney H. Watts
2532 Hogan Road
East Point, Georgia 30044

10 regular members. Founded 1967. Facilities: East Point, Georgia, 800' 1" track under construction.

RED RIVER VALLEY RAILWAY

Paul Winslow
304–1179 Grant Avenue
Winnipeg, Manitoba, Canada

10 regular members. Founded 1938. Facilities: Winnipeg, Man., 970' ½", ¾" and 1" track. Note: 1" track is 5" gauge.

RIVERSIDE LIVE STEAMERS

Merrill Van Noty
677 Flynn Street
Riverside, California 92507

52 regular members. Founded 1966. Facilities: Hunter Park, Riverside, Calif., 6500' 1½" track, 3000' 1" track under construction.

ROCKY MOUNTAIN LIVE STEAMERS

Art Wegner
3975 Yates Street
Denver, Colorado 80212

10 regular members. Founded 1947. Facilities: 500' ½" track on private property.

ST. LOUIS LIVE STEAMERS

Leo Myers
8121 Concord Drive
Clayton, Missouri 63105

10 regular members. Founded 1967. Facilities: various member's tracks.

SAGINAW VALLEY LIVE STEAMERS

Fred Gawe
338 Greenbrier Drive, S. E.
Grand Rapids, Michigan

SOUTHEASTERN LIVE STEAMERS

O. A. Ritch
1918 Winter Street
Charlotte, North Carolina 28205

9 regular members. Founded 1952. Facilities: Charlotte, N. C., 1800' ¾" elevated track.

SOUTHERN CALIFORNIA LIVE STEAM CLUB

K. G. Kepner
2764 Maple
Rialto, California 92376

73 regular members. Founded 1948. Facilities: Lomita, California, 800' ¾" and 1½", 1600' 1" track.

SOUTHERN MINNESOTA LIVE STEAMERS

Richard M. Winkle
220 First Avenue
Rochester, Minnesota 55901

32 regular members. Founded 1960. Facilities: member's private tracks.

TRI-COUNTY LIVE STEAMERS

Albert Cranston
1916 East Santa Ana Street
Anaheim, California 92805

15 regular members. Founded 1952. Members use private tracks. Club is outgrowth of Anaheim Model R. R. Society now interested in all forms of steam power.

UTAH LIVE STEAMERS

Lewis Searle
377 F Street
Salt Lake City, Utah 84103

Now forming. Letters or visits from Live Steam friends are encouraged to support this new activity.

WABASH, FRISCO & PACIFIC ASSOC.

George F. Kiesel, Jr.
6347 North Rosebury Avenue
St. Louis, Missouri 63105

26 regular members. Founded 1939. Facilities: 4000' 12"' gauge track on private property.

WAUSHAKUM LIVE STEAMERS

Kendell Bishop
52 Pond Street
Natick, Massachusetts

WEST VALLEY LIVE STEAMERS

Dwight Durkee
P. O. Box 21
Cupertino, California 95014

30 regular members. Founded 1963. Informal club made up mostly of G@LS members. Use private 1000' 1½" track.

Old #3 is ready,

AWAITING THE GREEN BOARD

ROBERT CLARKE PHOTOS

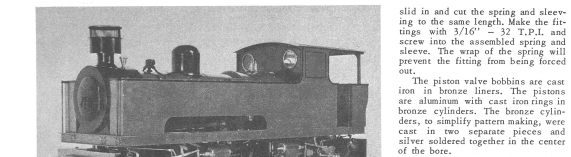
The crew, consisting of Edward Carlson and Ralph Grant in the cab, with Gordon Younger (l) and John LePage (r) on the ground with young Donald Wayne Kidd, poses for the photographer at the end of a shake-down run on July 1, 1967.

Great strides have been made towards excursion operation of the City of Winnipeg Hydro's Old #3 in the summer of 1968. All that remains to be done is the lease agreement with the City Council.

About $8,000 will be needed for insurance and supplies and 10,000 Membership Certificates are being printed which will sell for a dollar each. These certificates will be suitable for framing and will be issued by the *Vintage Locomotive Society*, an organization formed and registered by John LePage and Gordon Younger.

Support of this project by the entire Brotherhood of Live Steamers (which, incidentally, includes *all* Live Steamers) would be a worthy endeavor.

Send your dollar now to Vintage Locomotive Society, c/o John LePage, 471 Waverly Street, Winnipeg 9, Manitoba, Canada and share in the preservation and operation of this grand old 1882 locomotive.



a NEW ZEALAND model of a SOUTH AFRICAN locomotive built in ENGLAND

by J. S. Caverhill

The involved title refers to an 1¼" scale model of a two-foot gauge sugar plantation engine built in England by Bagnalls of Stafford for use in a sugar field in South Africa. The model was made from their works drawings. Although it is a scale not much used and usually refers to a model of larger size, the 2½" track gauge brings it back into perspective again. It is of 0–4–0 + 0–4–0 wheel arrangement and each bogie is articulated. The boiler is mounted on a separate frame similar to the Shays and Heislers. Other vital statistics on this locomotive would list the length as 19½", width 8½", height 9", wheels 2½" diameter, cylinders (4) 15/16" bore x 1¼" stroke and piston valves ½" diameter.

The boiler is most unusual in that the firebox as well as the barrel is cylindrical. Actually it is a marine type boiler with an internal flue type firebox with the fire bars inside the flue. Through the silver-soldered copper boiler barrel are the usual multi-tube arrangement and two superheater flues. The flue-type firebox means a dry backhead which can be hot on the fingers! The main advantage of this type of construction is a minimum of stays and although some authorities say this type of boiler is not a good steamer, this one has proved satisfactory.

Incidentally, for comparison, the dome is the same diameter as the track gauge.

Coal firing is used and the boiler pressure is 80 pounds per square inch. We have two types of coal available – one a lignite that burns to a fine white ash and the other a partially-processed coal in which the volatile constituents have been driven off but is not coke. Most of the New Zealand coals are bituminous and quickly clog the small fire tubes. I do not know of any oil-fired engines in this country except some full-sized ones.

One of the problems of articulated locomotives is the need for flexible steam pipes. I have found that by generating the spherical parts with a tubular scraper the flexible joints have been very satisfactory. Another point is the linkage from the reversing lever to the valve links which has to be arranged to enable the bogies or trucks to turn without altering the valve rod position in the swinging link.

The boiler feed is by an axle-driven pump in the rear bogie and a hand pump in one side tank. Attempts to build a satisfactory injector have met with no success.

The axle pump on a bogie that turns creates a problem of pressure hoses in a small country such as New Zealand where we do not have a big range of products to draw from. My method for this job was to use neoprene sleeving such as is used on the ends of mineral insulated electric cable. The trade name is "Pyrotenic" and is used in this manner: take a piece of sleeving with a bore of 5/32" and an outside diameter of ½". Wind a 24-gauge piano wire close-wound spring of such a diameter that the sleeving can just be slid in and cut the spring and sleeving to the same length. Make the fittings with 3/16" – 32 T.P.I. and screw into the assembled spring and sleeve. The wrap of the spring will prevent the fitting from being forced out.

The piston valve bobbins are cast iron in bronze liners. The pistons are aluminum with cast iron rings in bronze cylinders. The bronze cylinders, to simplify pattern making, were cast in two separate pieces and silver soldered together in the center of the bore.

The wheels are cast iron and the motion rods are annealed spring steel. You should try it some time... it does not pick up in the file like mild steel. The frames follow English practice and are made of plate correctly inset and fitted with the cross stretchers as shown on the maker's drawings from which the model was built. All the necessary angle was milled from square steel with a fly cutter in the lathe.

A very handy arrangement on not-so-well-laid tracks is the heavy buffer plate and the angle across near the cylinders. In the event of a derailment, the engine just rests on these and does not foul the track spacers. On the prototype there is only 3" clearance for this purpose.

Nine years were spent building this model and it has now been running seven years. The only replacements have been the cast iron piston valves for the original stainless steel and the installation of cast iron piston rings instead of the graphite yarn used first.

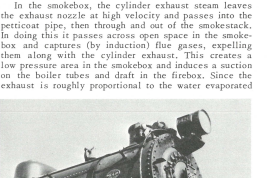
None of the bearings have been replaced although the engine has done much hard work at public track days hauling four and five children besides the driver and trying to keep headway when running in the company of high-wheeled, main line type locomotives!

SMOKEBOX

The smokebox might be defined as a plenum chamber (space) on the front end of a locomotive whose function it is to support the front end of the boiler. In addition, however, it also houses the smokestack extension (petticoat pipe), the exhaust nozzle and blower, live steam pipes, cinder screen, superheater manifolds, superheater dampers with their controls, and where applicable, the smokebox throttle.

The cinder screen and superheater dampers with their controls are not applicable to Live Steam locomotives due to lack of sufficient space in the smokebox for their installation; some person, however, might possibly make an installation just to prove that it could be done! The cinder screen, to be of any value, would have such fine mesh that it would plug itself with soot in very short order. The superheater dampers are to prevent the superheater tubes from overheating when the cylinders are not using steam. They open automatically when (1) the static pressure in the smokebox lowers (early version) or (2) the cylinders are using steam (later version). The open dampers permit the hot flue gases to pass through the superheater flues. In a Live Steam locomotive smokebox with its minimum of space, the superheater dampers would soon become inoperative due to accumulations of cinders and soot.

In the smokebox, the cylinder exhaust steam leaves the exhaust nozzle at high velocity and passes into the petticoat pipe, then through and out of the smokestack. In doing this it passes across open space in the smokebox and captures (by induction) flue gases, expelling them along with the cylinder exhaust. This creates a low pressure area in the smokebox and induces a suction on the boiler tubes and draft in the firebox. Since the exhaust is roughly proportional to the water evaporated



JOSEPH F. NELSON

Pennsy K-4s built in 1" scale by the author, looks and acts as powerful as its prototype.

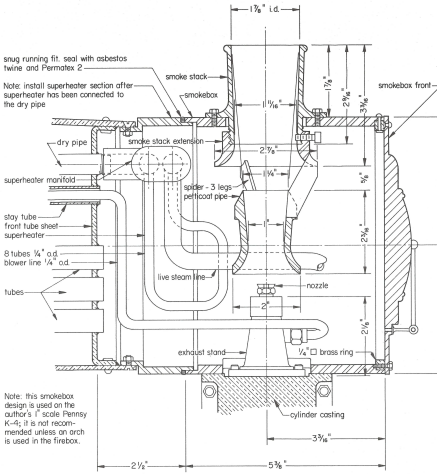
(horsepower), the air (oxygen) drawn through the bed of coal will support combustion at a rate to evaporate sufficient water to produce the required horsepower. This is, of course, oversimplifying a coordinated group of functions. Steam output does depend on nozzle design in relation to the petticoat pipe, the bed of coal, air leaks into the smokebox, the amount of soot in the tubes, the thickness of boiler scale, and other factors. Everything being equal, however, and so long as there is a good bed of coal in the grate, the rate of combustion is automatically controlled by the throttle opening.

The above is not exactly true for an oil burner since the fuel fed to the atomizer will vary with the power requirements and since the amount of fuel is variable (depending upon the load) it is necessary for the air to be proportioned to the amount of fuel being burned. It is customary to have two dampers operated by draft and one manually operated damper controlled by the fireman. Since the static pressure required to operate firebox dampers is a lot less than that necessary to draw air through a bed of coal, the oil burning locomotive usually has a larger blast nozzle which cuts down on exhaust back pressure and gives a softer exhaust.

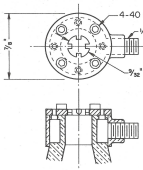
THE PETTICOAT PIPE

The petticoat pipe, combined with the smokestack forms an extended venturi somewhat similar to the venturi in a gasoline engine carburetor. The main difference between the two is that the venturi of the carburetor operates by air drawn through the venturi creating the highest velocity and lowest pressure at the smallest diameter of the venturi. The fuel spray nozzle is located at this point. The reverse is true on the locomotive petticoat pipe and exhaust nozzle as it is the exhaust from the nozzle that induces draft through the petticoat pipe with the exhaust nozzle being located somewhat below the petticoat pipe. Although the exhaust-nozzle-petticoat combination is nowhere near as critical as the venturi-spray-jet combination of the carburetor, the locomotive designers have gone to great lengths to improve the combination whereby a stronger draft could be produced without too great a penalty of exhaust back pressure. This was particularly true of coal burners. The flare on the bottom of the petticoat pipe is normally located at about the center of the smokebox but in checking smokebox drawings it will be found that quite a variation exists among the well-designed prototypes. Nevertheless one thing does stand out: on the later high-performance locomotives the distance from the bottom of the petticoat flare to the exhaust nozzle runs from about 1/6th to 1/8th of the smokebox diameter.

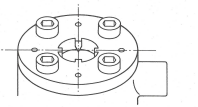
The smallest inside diameter of the petticoat pipe runs from 80% to 90% of the top inside diameter of the stack while the diameter of the petticoat flare goes from the same inside diameter of the top of the stack to about 1½ times the diameter. The above doesn't hold true in all cases since some stacks are perfectly straight on the inside and have a petticoat skirt 1.65 times the diameter of the stack bore. The important things to remember when designing the petticoat pipe flare are (1)


1 7/8" i.d.
snug running fit. seal with asbestos twine and Permatex 2
smoke stack
Note: install superheater section after superheater has been connected to the dry pipe
smokebox
1 11/16"
1 7/8"
2 11/16"
3 3/16"
smokebox front
dry pipe
smoke stack extension
2 7/8"
1 1/4"
superheater manifold
spider - 3 legs
petticoat pipe
5/8"
stay tube
front tube sheet
superheater
1"
2 3/16"
6 9/16"
8 tubes 1/4" o.d.
blower line 1/4" o.d.
live steam line
nozzle
tubes
2"
2 1/8"
exhaust stand
1/4" □ brass ring
Note: this smokebox design is used on the author's 1" scale Pennsy K-4; it is not recommended unless an arch is used in the firebox.
cylinder casting
3 3/16"
2 1/2"
5 3/8"

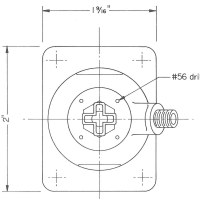
S M O K E B O X



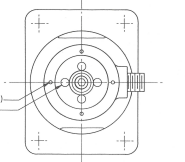
WEDGE NOZZLE

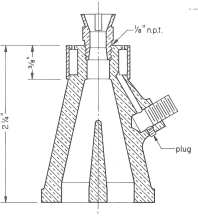


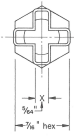
NOZZLE-BLOWER RING

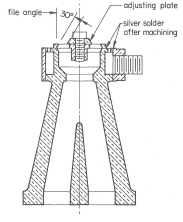


Note: all dimensions for 1" scale, others proportional.









STAR NOZZLE EXHAUST STAND

MULTI-PORTED NOZZLE EXHAUST STAND

EXHAUST STAND, BLOWER RING AND SPECIAL NOZZLES FOR COAL-BURNING LIVE STEAM LOCOMOTIVES

rfh/wct

JOSEPH F. NELSON

The authors 1" scale Pennsy D–16a illustrates an earlier vintage of steam power.

it must be large enough to catch any possible spillover from the exhaust nozzle and (2) sufficient clearance must be maintained between the petticoat flare and the exhaust nozzle so that the flow of flue gases into the petticoat pipe flare will not be restricted.

EXHAUST NOZZLES

The amount of exhaust blast exposed to the flue gases in the smokebox has a lot to do with how much draft it can produce at the grate. For example: a single round exhaust nozzle gives practically a cylindrical jet of exhaust steam through the stack with practically no drag on the flue gases. As grate areas became larger (resulting in stacks with greater cross-sectional area) the round exhaust nozzle could no longer produce the required draft. This caused the development of the wedge, the star and the multi-ported exhaust nozzles which gave more total area to the circumference of the exhaust blast and create more drag on the smokebox gases. This, in turn, increased the rate of combustion with an increase in horsepower output. In addition to the enlarged circumferential area of the exhaust blast, a turbulence is created which is more efficient in ejecting the flue gases, due also to the exhaust blast completely filling the cross-sectional area of the stack.

THE WEDGE NOZZLE

The wedge nozzle is very simple and should be very satisfactory for Live Steam locomotives. Since they are so easy to make and sizing a nozzle usually requires more than one attempt, the locomotive builder can make up a group of graduated orifice sizes and, in a single day's running at the track, find the one that gives his engine the best steaming.

THE STAR NOZZLE

The star nozzle is an excellent nozzle and has been used by this author on his 1" scale Pennsy K–4s and D–16a since they were originally built. They can be easily removed and changed at the track if experimentation with nozzle sizes is desired. The K–4s, which has an arch in the firebox, will operate about ¾ of the time with the fire door wide open with steam pressure between 100 and 120 psi. There is some tendency to lift small pieces of coal off the grate and carry them over the arch. It is also to be noted that the exhaust completely fills the large 1-7/8" I.D. stack. This exhaust system has a double petticoat pipe which starts with a small petticoat of 1" I.D. maintaining a constant taper across the gap between the two petticoats to the top of the stack.

THE MULTI-PORTED NOZZLE

The multi-ported nozzle provides problems for the Live Steam locomotive builder since it would require a casting to do a really good job, but in any form it is probably the best nozzle of the group. It provides excellent turbulence and will fill a large stack. It also can be adjusted to different capacities by the use of easily applied washers. It can be simulated with round holes instead of the triangular holes which are standard.

THE BLOWER

The blower usually consists of a group of small holes surrounding the exhaust nozzle, aligned so that they will blow up through the petticoat pipe. Steam is supplied from a globe valve on the backhead of the boiler or manifold. The general tendency of the locomotive builder is to put a lot of too-small blower holes in the blower head. These holes will quickly plug up with lime scale, particularly if one uses faucet water in his boiler. Also the least speck or piece of dirt will plug up a fine hole. In this writer's opinion, the blower holes should be no smaller than a #56 drill; his K–4s has four #55 holes and his D–16a has three #55 holes and steam can be raised very quickly in either engine.

THE BLOWER LINE

This line usually runs from the back of the boiler to the smokebox through a fore-and-aft stay tube although, in some cases, it may run along the boiler shell underneath the lagging jacket. Under no circumstances should this line for a 1" engine be smaller than ¼" O.D. copper tubing. A union should be used between the line and the blower head to permit removal of the line or exhaust stand. Do not use soft solder any lines in the smokebox due to the high temperature within the smokebox. One should use silver solder except that soft solder (95–5) may be used where steam lines are exposed to open air, 95–5 is a refrigeration solder and doesn't contain lead. Do not use 50–50 if you can help it.

THE LIVE STEAM LINES

These lines run from the dry pipe (or smokebox throttle or superheater manifold) to the cylinders. Before they pass through the smokebox wall unions should be installed to permit the removal of the boiler if and when it is necessary. Where the lines pass through the sides of the smokebox, plug the holes with non-hardening Permatex and asbestos-air at these points is disasterous to steaming.

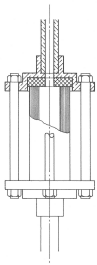
THE SMOKEBOX SHELL

The smokebox shell is usually made from a length of tubing or pipe of the proper size. Since air leaks into the smokebox destroy good steaming, it stands to reason that the smokebox must fit the saddle before bolting the two together permanently. It is considered good practice to turn the smokebox to its proper diameter and then bore the cylinder saddle to the matching radius. Do not use a gasket at this point since gaskets will mast out and eventually admit air. Before finally bolting the smokebox to the saddle and the stack to the smokebox, apply a 1/32" thick layer of non-hardening Permatex (#2) to all matching surfaces.

LIVE STEAM DATA SHEET

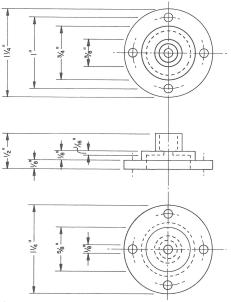
ADOPTED AS STANDARD EQUIPMENT ON THE
ADDISON VALLEY RAILROAD
Westchester, Illinois

Scale: Full size | Drawn: Bud Hoxy/act



ASSEMBLY

Silver solder 1/4" copper tubes top and bottom and connect to boiler.



ENDS
2 required

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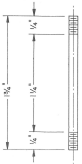

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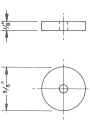

GASKETS
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WATER GAUGE

I am very sorry to have to report that

L. LAWRENCE (LBSC)

passed away on November 4th, 1967. LBSC started writing regularly for Model Engineer Magazine in 1924; although he contributed some very interesting letters before this date, notably during the so-called "Battle of the Boilers" and over the contest with the Bassett-Lowke oil-fired locomotive Challenger. *He continued writing for Model Engineer up until a few months before his death, except for the period from May 1959 to early 1966.*

LBSC devoted most of his life to the design and construction of small steam locomotives that never liked the term "model") and the popularity of this branch of model engineering today is largely the result of his articles. His simple and friendly way of writing won him friends throughout the world and, but for him, many readers would never have contemplated building Live Steam locomotives.

His "Lobby Chats" were looked forward to by thousands of enthusiasts, including myself, and although we occasionally disagreed with some of his ideas, this did not prevent us thoroughly enjoying everything he wrote.

On many occasions I wrote to LBSC regarding model locomotive design and always found him most helpful and forthcoming with advice; yet it was not until 1963 that I was able to meet him personally and to see and admire his remarkable workshop and his huge collection of locomotives from 0-gauge to 3½ inch.

There is little doubt that LBSC will be remembered as one of the great pioneers of model steam locomotives, ranking with names such as Percival Marshall, Bassett-Lowke, Henry Greenly and J. N. Maskelyne. Even if they do not build small locomotives, all our readers will very much miss his articles, but his engines and hundreds built to his designs will be a constant reminder of their designer for many years to come.

MARTIN EVANS
EDITOR
MODEL ENGINEER

1968 OFFICERS FOR GGLS

Fifty-eight members of the Golden Gate Live Steamers turned out for the December meeting and elected a new slate of officers for 1968.

Winton Brown is the new President with Tom Stambaugh in the Vice President's chair. Bill Ray takes over at the Treasurer's window and Ron Downer is the new Secretary.

Another item of business was the setting of August 24th and 25th as the dates for the Fall Meet in 1968, to correspond with the National Model Railroad Association Convention to be held in San Francisco on that week end.

NJLS MEETS ANNOUNCED

Ralph Green, Secretary of the New Jersey Live Steamers, advises that the Welcome Mat will be dusted off (it's always out for Live Steamers!) for a Spring Meet on June 14, 15 and 16 as well as a Fall Meet on September 20, 21 and 22.

Plan now to attend if you can.

SOUTHWICK DATES SET

That bark of exhausts that is music to any Live Steamer's ears will resound through the hills of Massachusetts when the Pioneer Valley Live Steamers play host for two 1968 meets.

The annual Spring Meet will be held on May 17, 18 and 19 this year and the Fall Meet will fall on October 11, 12 and 13. Both will provide lots of action and good fellowship.

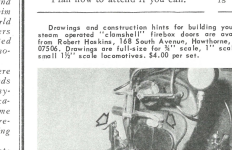
DATE FOR CMEA SHOW

The Annual Exhibition of the Chicago Model Engineers Association will be held at the Museum of Science and Industry in Chicago from March 16th through 24th.

This Exhibition, reinstated three years ago, features displays of model construction in all fields of the hobby including aircraft, boats, traction, stationary and locomotives. Operating and static displays provide a good opportunity to see what is being built in the Windy City.

Drawings and construction hints for building your own steam operated "clamshell" firebox doors are available from Robert Haskins, 168 South Avenue, Hawthorne, N. J. 07506. Drawings are full-size for 5" scale, 1" scale and small 1½" scale locomotives. $4.00 per set.

STEAM OPERATED FIREBOX DOORS



NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS

BRUMLEY OFFERS NEW 1½" TRUCKS

A recent addition to the line of 1½" castings available from Evert Brumley, Route 4, Box 222, Winchester, Indiana 47394 is this 1½" scale "Deluxe" freight car truck. Information about these trucks and other 1½" scale castings can be had for 25¢, at the address above.

Scheduled Meets

MARCH
16 CHICAGO MODEL ENGINEERS ASS'N. to Annual Exposition
24 Museum of Science & Industry
Perry Smith, Secretary
3430 West 65th Street
Chicago, Illinois 60629

MAY
17 PIONEER VALLEY LIVE STEAMERS
18 Annual Spring Meet
19 3½" – 4½" – 7¼"
Brenton W. Barnfather, Secy.
3 Fleetwood Drive
Sandy Hook, Conn. 06482

JUNE
14 NEW JERSEY LIVE STEAMERS
15 Annual Spring Meet
16 3½" – 4½" – 7¼"
Ralph Green, Secretary
845 Kilsyth Road
Elizabeth, N. J. 07208

AUGUST
24 GOLDEN GATE LIVE STEAMERS
25 Annual Fall Meet
2½" – 3½" – 4½" – 7½"
Ron Downer, Secretary
1274 36th Avenue
San Francisco, Calif. 94122

SEPTEMBER
20 NEW JERSEY LIVE STEAMERS
21 Annual Fall Meet
22 3½" – 4½" – 7½"
Ralph Green, Secretary
845 Kilsyth Road
Elizabeth, N. J. 07208

REGULAR RUN DAYS
GOLDEN GATE LIVE STEAMERS
Every Sunday, weather permitting
2½" – 3½" – 4½" – 7½"
Ron Downer, Secretary
1274 36th Avenue
San Francisco, Calif. 94122

JAMUL VALLEY RAILROAD CLUB
3rd Sunday of each month
7½" gauge
Charles Underhill, Secretary
4675 Coronado Avenue
San Diego, Calif. 92107

LOS ANGELES LIVE STEAMERS
1st Saturday & Sunday each month
3½" – 4½" – 7½"
W. Ross Crawford, Secretary
6900 Royer Street
Canoga Park, Calif. 91304

NEW JERSEY LIVE STEAMERS
1st & 3rd Sundays each month
3½" – 4½" – 7½"
Ralph Green, Secretary
845 Kilsyth Road
Elizabeth, N. J. 07208

RIVERSIDE LIVE STEAMERS
4th Saturday & Sunday each month
7½" gauge
Merril Van Noty, Secretary
677 Flynn Street
Riverside, Calif. 92507

SOUTHERN CALIFORNIA LIVE STEAM CLUB
3rd Sunday each month
3½" – 4½" – 7½"
K. G. Kepner, Secretary
2764 Maple
Rialto, California 92376

BLS DECALS AND BUTTONS

For the benefit of newcomers to these pages of LIVE STEAM, and as a reminder to those who have not yet responded, we would mention that the emblem of the Brotherhood of Live Steamers is available in the form of a decal for 50¢ from Donald F. Bauer, 91 Hickory Lane, Deerfield, Illinois 60015 or from any of the BLS secretaries.

This emblem may be offered in the form of a plastic button with a metal back and safety pin (similar to

political campaign buttons) if there is enough interest in them. All of the Live Steam Clubs have been advised of this possibility and the bulk of the response should come from these organizations. If you are not a member of a Live Steam club but would be interested in buying these buttons, drop a note to Don Bauer at the above address so that he will be able to discuss quantities and prices with the manufacturers.

If the response is sufficient to warrant the expense of having them made up, notice of their availability will be made directly to the Live Steam Clubs and through future issues of LIVE STEAM.

INSURANCE INFORMATION NEEDED

The all-important matter of insurance for Live Steam Clubs, and possibly for individual Live Steamers, is getting serious attention from one of our fraternity: Eugene Cranston of the Riverside Live Steamers.

A study has been started by checking with Live Steam Clubs in his area, but more information would be of great assistance in formulating a standard policy that can be used by all insurance companies for this specialized coverage. In so doing, the companies will have the benefit of specific information rather than to "go it alone" when a club asks for coverage.

Information is needed about the amount of coverage clubs carry or would carry if rates were established; about the type and extent of coverage; about the amount of present premiums being paid; the kind of claims presented for collection and their frequency; the name and address of the insuring company, the agent and the club member to contact for specific information that might be needed later. Was the agent a Live Steamer who arranged the coverage as a convenience to the club and were there any problems in obtaining adequate coverage or in adjustment of claims?

Realizing the need for such information and the correspondence that can be generated in such an undertaking, LIVE STEAM has offered to announce this project and to accept and forward all data. We cannot enter into correspondence on this matter, but will report in these columns the progress and outcome of the study.

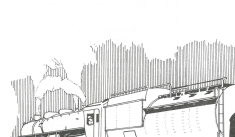
Other insurance agents, incidentally, are invited to make themselves known for they, too, may be able to offer their experience and background.

It could be gremlins... that sneak around when we aren't looking and make those little mistakes that have such big meaning! Blame this one, though, on General Confusion and correct page 14 of your November-December issue, please.

The CHECK VALVE data should read:

"d – Diameter of Port – .707 x D"

instead of .707 x d.



mail stop

WOULD-LIKE-TO-SEE DEPARTMENT

Would it be possible to have a construction series on some steam project? May I suggest a basic or simple series on a stationary engine and boiler where blueprints and castings are available. My aim is at the young people, to get them interested and enthused.

Later on, a series on a locomotive in the same idea for the more advanced builder.

WM. R. CLEVELAND
1850 JACKSON ROAD
COLUMBUS, OHIO 43223

I wish to take this opportunity to commend you on the great selection of articles, particularly the series by Joe Nelson. Keep them coming.

I would like to see a series on patternmaking and casting at some future date.

PAUL H. RALSTON
773 PUEBLA STREET
ENCINITAS, CALIF. 92024

I am interested in opinions and experiences of others in regards to water and water treatment for small boilers. I don't feel that compound is the answer... if enough is used to keep the lime in solution, it tends to make the boiler prime.

How about using water that comes from a zeolite softner? What about rain water?

I would like to hear from other Live Steamers on this and on two other subjects I am interested in: steam air compressors and steam turbine generators.

A. C. OTTO
ROUTE 1
SANDWICH, ILL. 60548

I, for one, would like to express an interest in seeing an article by Mr. Hannum discussing the construction of the fine little 0-4-0.

My personal interests are mainly in small-gauge engines because my shop is equipped with very small machinery. I have been building in Gauge 1 and would like to move up the scale a bit staying within the limits of my equipment. It would suit me very well to see a construction article on a good 2½" gauge engine.

RUDY KOUHOUPT
691 GARRETSON ROAD
SOMERVILLE, N. J. 08876

IDEAS WANTED

I plan to build a home in North Port Charlotte, Florida when I retire – which should be in about five to ten years. I have already purchased property and want a live steam layout around the house and on the extra lot beside our property.

If I were to send you a scale drawing of the property with dimensions and my ideas of a layout on it, do you suppose there might be interest among subscribers (who have done this already) to offer solid constructive hints, etc.? I don't even know if what I have in mind is possible and/or what can be done in the space. Lot frontage is about 215 feet across the front and varies from 90 to 135 deep.

ARTHUR K. KENNEDY
GUNARMA, AMER-CAN EMBASSY
BOX 2000
APO NEW YORK 09295

FIRING WITH PROPANE

Through the good suggestion of Messrs. Johnson and Morgan of Vapo Butane Company we have set up a burner in our 1½" scale engine. When we want to, we can turn up the valve and our steam gauge will start to move within 6 minutes from the time we light the fire.

It gives a clean, odorless fire (neighbors can't complain we are polluting the air), no more flues to clean after every run day or adjusting the steam so as to mix with, say, diesel fuel. We now spend more time driving the loco rather than keeping up the fire. We have a 5 gallon bottle on the first car and when empty we refill this from a 25 gallon bottle.

Have heard that some others have not had good luck with propane and I think the reason is they are using the regulator that comes with the bottle. We discarded this and put on about a 130# regulator and with this can get plenty of heat. It is not dangerous *if you are careful* – if one checks his gas tank with a lighted match, this is not for them!

Only thing we have not done yet is run a line to the smokebox and let crude oil drip in for our smoke.

C. K. BECK
1420 N. MC CULLOUGH AVE.
SAN ANTONIO, TEXAS 78212

Steam Operated Fire Doors
¾" – 1" – small 15/8" locomotives. Push a valve, doors pop open – no more burned fingers! Build yours from our complete (3 sheets) drawings, instructions. $4.00
ROBERT HOSKINS
168 South Ave. Hawthorne, N. J. 07506

LOCOMOTIVES WANTED
Complete or incomplete, ¾" Send details with photo 1" and asking price to 1½"
Pleasant Valley Railroad
5 Councilman Ave., Baltimore, Md. 21206

1½" Scale Truck Castings
$40.00 per pair
Send 25¢ for photo to
BEN NIXON
927 Woodland, Southampton, Pa. 18966

ACCURATELY SCALED
115 lb. A.R.E.A. RAIL
1½" SCALE
SEND 25¢ FOR SAMPLE TO
PAUL B. CULP
617 Fanshawe Street
Philadelphia, Pa. 19111

$100.00 REWARD!
if you tell me where I can buy a steam train up to 24" gauge that I haven't already contacted. Earliest postmark gets the reward. I pay cash, pick up and don't have to ask my wife if I can buy it.
HENRY J. McMILLAN - Galva, Ill. 61434

...from the cupola

During the past few months some questions have been raised about the EXTRA BOARD listings and the answers may prove to be interesting to many of the readers.

For one thing, the free ad does not need to be sent in with a subscripcion or renewal. The offer is open and encouraged during the term of your subscription or renewal so if there is something you want or need, or if you have something that you think other Live Steamers might need, make up an ad and send it in. If you want it to run for more than a month, the 5¢ per word applies, but just include your check with your order. Space for these ads is limited and they are published on a first-come first-served basis so it is possible that your ad might not appear for a month or two after you send it in.

The free-ad offer cannot, however, be carried over from one year to the next because of the involved bookkeeping and records that would be required to substantiate "accumulated" free ads.

The EXTRA BOARD, too, must be restricted to ads of a hobby nature. If you've worked hard on some patterns or a product and want to sell a few items to realize something for your time... fine! This Live Steam hobby is growing fast and there will be need for many products and many suppliers to satisfy the varied interests of the hobbyists. But plan to advertise these ventures with a space ad or a business card. The rates are reasonable and the response, we hear, is good. We're anxious, too, to help your venture along with a write-up in the NEW PRODUCTS columns if you will tell us about it.

With the inch or two left in this column we'd like to reflect again on Scotty's comment when we took over his Live Steam Newsletter a year-and-a-half ago: "Live Steamers are a wonderful bunch of guys!" We realize how right he was when we receive hundreds of Christmas greetings from Live Steamers all over the world... and when the phone rings and we find it is Dr. Hoffman down in Richmond, Illinois, taking a break during a hectic period of evening office hours to relax and tell us how much he enjoys reading LIVE STEAM... and when Martin Evans takes time out from his work on *Model Engineer* in London to respond to our request for a few words at the passing of LBSC. A very warm "Thank You" to you all!

— W.C.F. —

THE EXTRA BOARD

Items for sale or wanted to purchase by hobbyists. One free ad included with subscription, additional ads 5¢ per word with order.

WANTED

A good used 1" Live Steam engine, either 4-8-4 or 4-6-2, coal fired. If available submit full details and photo. Thomas C. Phillips, Sr., P. O. Box 588, Hapeville, Georgia 30054.

Electric trains made before 1941. Will pay top cash. Also want Buddy-L push toys. Al Staufer, Route 4, Medina, Ohio.

FOR SALE

Colored photo 10" x 20" of S. P. "DAYLIGHT" done in transparent oil color. Jack Fecco, 4309 Edenhurst Ave., Los Angeles, Calif. 90039.

3" Case steam traction engine with 2 sets of wheels – steel and rubber tired. James B. Ridenour, 150 Scenic Drive, Vinton, Iowa 52349.

3" scale EMD loco 15" gauge has hydraulic brakes, 6 HP air cooled engine. Front and rear trucks alive, 1 pair extra trucks for coach. John L. Hrebenar, Shaw Road R. D. #1, Conklin, N. Y. 13748.

Model of 1915 Case Steam Tractor, 2" Scale. Will operate on coal or bottled gas. Professionally made with industrial enamel finish. This tractor has never been run so it is not worn out. Will sell for cost of materials, $800.00. H. Adams, 211 S. Lafayette Blvd., Warren, Michigan 48091.

"Proposed SOUTHEASTERN RAILROAD" Vol. I and II. Vol. I (56 pages, 24 pictures) tells of efforts to start a new railroad from Atlanta to Savannah, Georgia. Vol. II (80 pages, 14 color pictures, 49 b&w) tells history leading up to Budd RDC cars and dome cars plus chapter of events leading to abandonment of passenger service by West Shore Railroad. $1.00 each from E. T. Mitchell, 107 W. Circular Ave., Paoli, Pa., 19301.

1½" scale 7½" gauge 4-6-4 oil burner, 12" steel boiler, steam operated water pump and 6V generator, excellent steamer. Mrs. Raymond Terrling, 13856 Via Cordoba, San Lorenzo, Calif. 94580, phone 415-276-0768.

4" scale 4-4-0, 800 feet of steel rail on ties and 100 feet of aluminum rail on ties all for $1,200. W. K. Hayman, 3174 29th Street, Zion, Illinois 60099.

SAFETY FIRST
is not a slogan. It is
RULE ONE
in Live Steam

RUTLAND DRAWINGS

1½" scale elevations and sections of RUTLAND RAILROAD class F-2½ 4-6-0 engines. For information write to:
Walter H. Allen
962 Greenland Road
Portsmouth, N. H., 03801

1½" scale trucks, couplers, stake pockets, frogs, drivers, etc. Send 25¢ for photo and information
EVERT BRUMLEY
Route #4, Box 222
Winchester, Indiana 47394

LOCOMOTIVES BUILT TO ORDER
Machined to any stage
Torn's Machine & Engineering Co.
808 McPhaul Street
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3/4" – 1½" Scale
Castings, Blueprints and Materials
16 Engines in CATALOG #3 – $1.00
FRIENDS MODELS
R.F.D. Topsfield, Mass. 01983

3/4" SCALE NYC HUDSON
Castings, drawings, freight trucks, wheels, bolsters, springs. Write for list.
CARL HOFFMAN
25 Thornridge Crescent
Kitchener, Ontario, Canada

MODEL BOILERS
Built and Repaired
Also Boiler Parts Formed Out
MODEL BOILERS
Box 178 Ventura, California 93001

Black line prints from original Cooke, Manchester and Rhode Island Works tracings. Send 50¢ for the lists of drawings.
C. A. PURINTON
R.F.D. Boxford, Mass. 01921

Photos, 1½" scale erection drawings 10 CNR-CPR locos from MLW-CLCo tracings. CNR Standard Hall drawings, miscellaneous prints. CATALOG #2-35¢ contains diagram sheets of all locos.
WILLIAM DYKEMAN
890 Bay Ave., Bathurst, N.B., Canada

MINIBOLTS – Perfect little hex head miniature machine bolts in Mild Steel, Brass and Stainless Steel. #0 to #12 diameters in popular and special lengths. For "factory direct" prices write to "BOB" at
Sierra Swiss Product Engineering
P. O. Box 67 Fownskin, Calif. 92333

PATTERN SELECTION ENLARGED
¾" – 1" – 1½" scale locomotives and horizontal stationary engine. Send self-addressed #10 envelope with 12¢ POSTAGE for list #6 to
Live Steam Pattern Pool
962 Greenland, Portsmouth, N. H., 03801

Live Steam
TO HOBBY & OLD TIME

Post Office Box 635
Cadillac, Michigan 49601

ADDRESS CORRECTION REQUESTED.

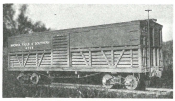
BULK RATE
U. S. POSTAGE
PAID
CADILLAC, MICHIGAN 49601
PERMIT #105

Peter Spinney
36 Atlantic St.
Gloucester, Mass. 01930

1½" Scale Cars
Assembled or Kit Form
Castings – Metal Parts – Lumber
Complete custom building service
Catalog 25¢

J & J MODELS
15712 South Condon Avenue
Lawndale, California 90260

M & W
ZIMMER MODELS
P.O. Box 340
Argo, Illinois 60501



NEW 1½" Scale 36'-6"
STOCK CAR
Completely Assembled or Kit Form
ALSO
Semi-Assembled Kit Form
MILLED SCALE LUMBER FOR
CARS AND STRUCTURES
NO RAILROAD IS COMPLETE
WITHOUT A STOCK CAR
Send 25¢ in coin for information
THE -1900 Vintage
Stock Car & Scale Lumber

REAL STEAM TRAINS
15" – 16" – 24" – 36" Gauges

"LITTLE TOOT"
Send for FREE circular
CROWN METAL PRODUCTS CO.
WYANO, PENNSYLVANIA 15695

TIMKEN DESIGN ROLLER
BEARING TRUCK KITS
Convert to 7¼" or 7½" gauge in 15 minutes. Send 25¢ for complete description and photos.
BUCKEYE MODEL CASTINGS
720 Waller Street
Portsmouth, Ohio 45662

1" scale trucks and car parts
Send for free list
NELSON W. GRAY
900 East Brighton Avenue
Jamesville, N. Y. 13078

Live Steam
Locomotives
1966 Catalog
Just bolt 'em together

You can have a backyard Railroad completely steam powered — including all accessories. Complete parts and plans with easy, no fuss "Just Bolt Together" instructions available to your home. Old time & modern locomotives in 1" to 2" scale. Send 50¢ for 1966 catalog. SPECIAL OFFER: 7½" scale, 0-4-0 STEAM POWERED RR. in our 100-page catalog. Free.
LITTLE ENGINES - Box N Lomita, Calif.
Established 35 Years 90717

1" scale Live Steam model of "The General" built by Leo Myers of Clayton, Missouri can currently be seen in

CUSTER OF THE WEST

AT CINERAMA® THEATRES IN
Portland, Sacramento, Los Angeles, Denver, Houston, Dallas, Kansas City, St. Louis, New Orleans, Knoxville, Louisville, Columbus, Detroit, Buffalo, Baltimore.

WINTON Live Steam Locomotives
1½" – 3" Scale
DIESEL – 1½"

3RD EDITION CATALOG. Rough or machined castings, or ready to operate locomotives, rail, accessories, gift items. Many new models and engines added. Send 11 x 14" Catalog $2.00 in U.S.A. and Canada. 3rd class postpaid. Add 50¢ for 1st class. (other countries $3.50)

WINTON ENGINEERING COMPANY - DEPT. N
P.O. Box 355 Danville, California 94526
Phone day or evening – (415) 837-4368

LIVE STEAM DATA SHEET

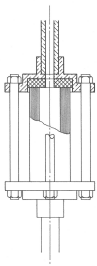
ADOPTED AS STANDARD EQUIPMENT ON THE

ADDISON VALLEY RAILROAD

Westchester, Illinois

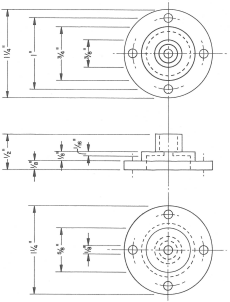
Scale: Full size

Drawn: Bud Navy/ecf



ASSEMBLY

Silver solder 1/4" copper tubes top and bottom and connect to boiler.



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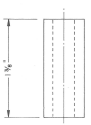

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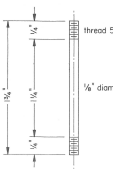

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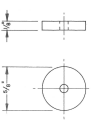

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His "Lobby Chats" were looked forward to by thousands of enthusiasts, including myself, and although we occasionally disagreed with some of his ideas, this did not prevent us thoroughly enjoying everything he wrote.

On many occasions I wrote to LBSC regarding model locomotive design and always found him most helpful and forthcoming with advice; yet it was not until 1963 that I was able to meet him personally and to see and admire his remarkable workshop and his huge collection of locomotives from 0-gauge to 3½ inch.

There is little doubt that LBSC will be remembered as one of the great pioneers of model steam locomotives, ranking with names such as Percival Marshall, Bassett-Lowke, Henry Greenly and J. N. Maskelyne. Even if they do not build small locomotives, all our readers will very much miss his articles, but his engines and hundreds built to his designs will be a constant reminder of their designer for many years to come.

MARTIN EVANS
EDITOR
MODEL ENGINEER

1968 OFFICERS FOR GGLS

Fifty-eight members of the Golden Gate Live Steamers turned out for the December meeting and elected a new slate of officers for 1968.

Wintoo Brown is the new President with Tom Stambaugh in the Vice President's chair. Bill Ray takes over at the Treasurer's window and Ron Downer is the new Secretary.

Another item of business was the setting of August 24th and 25th as the dates for the Fall Meet in 1968, to correspond with the National Model Railroad Association Convention to be held in San Francisco on that week end.

NJLS MEETS ANNOUNCED

Ralph Green, Secretary of the New Jersey Live Steamers, advises that the Welcome Mat will be dusted off (it's always out for Live Steamers!) for a Spring Meet on June 14, 15 and 16 as well as a Fall Meet on September 20, 21 and 22.

Plan now to attend if you can.

SOUTHWICK DATES SET

That bark of exhausts that is music to any Live Steamer's ears will resound through the hills of Massachusetts when the Pioneer Valley Live Steamers play host for two 1968 meets.

The annual Spring Meet will be held on May 17, 18 and 19 this year and the Fall Meet will fall on October 11, 12 and 13. Both will provide lots of action and good fellowship.

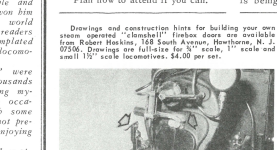
DATE FOR CMEA SHOW

The Annual Exhibition of the Chicago Model Engineers Association will be held at the Museum of Science and Industry in Chicago from March 16th through 24th.

This Exhibition, reinstated three years ago, features displays of model construction in all fields of the hobby including aircraft, boats, traction, stationary and locomotives. Operating and static displays provide a good opportunity to see what is being built in the Windy City.

Drawings and construction hints for building your own steam operated "clamshell" firebox doors are available from Robert Hoskins, 168 South Avenue, Hawthorne, N. J. 07506. Drawings are full-size for 5" scale, 1" scale and small 1½" scale locomotives. $4.00 per set.

STEAM OPERATED FIREBOX DOORS



NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS

BRUMLEY OFFERS NEW 1½" TRUCKS

A recent addition to the line of 1½" castings available from Evert Brumley, Route 4, Box 222, Winchester, Indiana 47394 is this 1½" scale "Deluxe" freight car truck. Information about these trucks and other 1½" scale castings can be had for 25¢, at the address above.

Scheduled Meets

MARCH
16 CHICAGO MODEL ENGINEERS ASS'N. to Annual Exposition
24 Museum of Science & Industry
Perry Smith, Secretary
3430 West 65th Street
Chicago, Illinois 60629

MAY
17 PIONEER VALLEY LIVE STEAMERS
18 Annual Spring Meet
19 3½" – 4¾" – 7½"
Brenton W. Barnfather, Secy.
3 Fleetwood Drive
Sandy Hook, Conn. 06482

JUNE
14 NEW JERSEY LIVE STEAMERS
15 Annual Spring Meet
16 3½" – 4¾" – 7½"
Ralph Green, Secretary
845 Kilsyth Road
Elizabeth, N. J. 07208

AUGUST
24 GOLDEN GATE LIVE STEAMERS
25 Annual Fall Meet
2½" – 3½" – 4¾" – 7½"
Ron Downer, Secretary
1274 36th Avenue
San Francisco, Calif. 94122

SEPTEMBER
20 NEW JERSEY LIVE STEAMERS
21 Annual Fall Meet
22 3½" – 4¾" – 7½"
Ralph Green, Secretary
845 Kilsyth Road
Elizabeth, N. J. 07208

REGULAR RUN DAYS
GOLDEN GATE LIVE STEAMERS
Every Sunday, weather permitting
2½" – 3½" – 4¾" – 7½"
Ron Downer, Secretary
1274 36th Avenue
San Francisco, Calif. 94122

JAMUL VALLEY RAILROAD CLUB
3rd Sunday of each month
7½" gauge
Charles Underhill, Secretary
4675 Coronado Avenue
San Diego, Calif. 92107

LOS ANGELES LIVE STEAMERS
1st Saturday & Sunday each month
3½" – 4¾" – 7½"
W. Ross Crawford, Secretary
6900 Royer Street
Canoga Park, Calif. 91304

NEW JERSEY LIVE STEAMERS
1st & 3rd Sundays each month
3½" – 4¾" – 7½"
Ralph Green, Secretary
845 Kilsyth Road
Elizabeth, N. J. 07208

RIVERSIDE LIVE STEAMERS
4th Saturday & Sunday each month
7½" gauge
Merril Van Noty, Secretary
677 Flynn Street
Riverside, Calif. 92507

SOUTHERN CALIFORNIA LIVE STEAM CLUB
3rd Sunday each month
3½" – 4¾" – 7½"
K. G. Kepner, Secretary
2764 Maple
Rialto, California 92376

BLS DECALS AND BUTTONS

For the benefit of newcomers to these pages of LIVE STEAM, and as a reminder to those who have not yet responded, we would mention that the emblem of the Brotherhood of Live Steamers is available in the form of a decal for 50¢ from Donald F. Bauer, 91 Hickory Lane, Deerfield, Illinois 60015 or from any of the BLS secretaries.

This emblem may be offered in the form of a plastic button with a metal back and safety pin (similar to

political campaign buttons) if there is enough interest in them. All of the Live Steam Clubs have been advised of this possibility and the bulk of the response should come from these organizations. If you are not a member of a Live Steam club but would be interested in buying these buttons, drop a note to Don Bauer at the above address so that he will be able to discuss quantities and prices with the manufacturers.

If the response is sufficient to warrant the expense of having them made up, notice of their availability will be made directly to the Live Steam Clubs and through future issues of LIVE STEAM.

INSURANCE INFORMATION NEEDED

The all-important matter of insurance for Live Steam Clubs, and possibly for individual Live Steamers, is getting serious attention from one of our fraternity: Eugene Cranston of the Riverside Live Steamers.

A study has been started by checking with Live Steam Clubs in his area, but more information would be of great assistance in formulating a standard policy that can be used by all insurance companies for this specialized coverage. In so doing, the companies will have the benefit of specific information rather than to "go it alone" when a club asks for coverage.

Information is needed about the amount of coverage clubs carry or would carry if rates were established; about the type and extent of coverage; about the amount of present premiums being paid; the kind of claims presented for collection and their frequency; the name and address of the insuring company, the agent and the club member to contact for specific information that might be needed later. Was the agent a Live Steamer who arranged the coverage as a convenience to the club and were there any problems in obtaining adequate coverage or in adjustment of claims?

Realizing the need for such information and the correspondence that can be generated in such an undertaking, LIVE STEAM has offered to announce this project and to accept and forward all data. We cannot enter into correspondence on this matter, but will report in these columns the progress and outcome of the study.

Other insurance agents, incidentally, are invited to make themselves known for they, too, may be able to offer their experience and background.

It could be gremlins... that sneak around when we aren't looking and make those little mistakes that have such big meaning! Blame this one, though, on General Confusion and correct page 14 of your November-December issue, please.

The CHECK VALVE data should read:

"d = Diameter of Port - .707 x D"

instead of .707 x d.

mail stop

WOULD-LIKE-TO-SEE DEPARTMENT

Would it be possible to have a construction series on some steam project? May I suggest a basic or simple series on a stationary engine and boiler where blueprints and castings are available. My aim is at the young people, to get them interested and enthused.

Later on, a series on a locomotive in the same idea for the more advanced builder.

WM. R. CLEVELAND
1850 JACKSON ROAD
COLUMBUS, OHIO 43223

I wish to take this opportunity to commend you on the great selection of articles, particularly the series by Joe Nelson. Keep them coming.

I would like to see a series on patternmaking and casting at some future date.

PAUL H. RALSTON
779 PUEBLA STREET
ENCINITAS, CALIF. 92024

I am interested in opinions and experiences of others in regards to water and water treatment for small boilers. I don't feel that compound is the answer... if enough is used to keep the lime in solution, it tends to make the boiler prime.

How about using water that comes from a zeolite softner? What about rain water?

I would like to hear from other Live Steamers on this and on two other subjects I am interested in: steam air compressors and steam turbine generators.

A. C. OTTO
ROUTE 1
SANDWICH, ILL. 60548

I, for one, would like to express an interest in seeing an article by Mr. Hannum discussing the construction of the fine little 0-4-0.

My personal interests are mainly in small-gauge engines because my shop is equipped with very small machinery. I have been building in Gauge 1 and would like to move up the scale a bit staying within the limits of my equipment. It would suit me very well to see a construction article on a good 2½" gauge engine.

RUDY KOUHOUPT
691 GARRETSON ROAD
SOMERVILLE, N. J. 08876

IDEAS WANTED

I plan to build a home in North Port Charlotte, Florida when I retire – which should be in about five to ten years. I have already purchased property and want a live steam layout around the house and on the extra lot beside our property.

If I were to send you a scale drawing of the property with dimensions and my ideas of a layout on it, do you suppose there might be interest among subscribers (who have done this already) to offer solid constructive hints, etc.? I don't even know if what I have in mind is possible and/or what can be done in the space. Lot frontage is about 215 feet across the front and varies from 90 to 135 deep.

ARTHUR K. KENNEDY
DURARMA, AMERICAN EMBASSY
BOX 2000
APO NEW YORK 09295

FIRING WITH PROPANE

Through the good suggestion of Messrs. Johnson and Morgan of Vapo Butane Company we have set up a burner in our 1½" scale engine. When we want to, we can turn up the valve and our steam gauge will start to move within 6 minutes from the time we light the fire.

It gives a clean, odorless fire (neighbors can't complain we are polluting the air), no more flues to clean after every run day or adjusting the steam so as to mix with, say, diesel fuel. We now spend more time driving the loco rather than keeping up the fire. We have a 5 gallon bottle on the first car and when empty we refill this from a 25 gallon bottle.

Have heard that some others have not had good luck with propane and I think the reason is they are using the regulator that comes with the bottle. We discarded this and put on about a 130# regulator and with this can get plenty of heat. It is not dangerous *if you are careful* – if one checks his gas tank with a lighted match, this is not for them!

Only thing we have not done yet is run a line to the smokebox and let crude oil drip in for our smoke.

C. K. BECK
1420 N. MC CULLOUGH AVE.
SAN ANTONIO, TEXAS 78212

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¾" – 1" – small 2½" locomotives. Push a valve, doors pop open – no more burned fingers! Build yours from our complete (3 sheets) drawings, instructions . . . $4.00

ROBERT HOSKINS
168 South Ave. Hawthorne, N. J. 07506

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1½" Scale Truck Castings

$40.00 per pair
Send 25¢ for photo to

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115 lb. A.R.E.A. RAIL
SCALE
SEND 25¢ FOR SAMPLE TO
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617 Fenshaw Street
Philadelphia, Pa. 19111

$100.00 REWARD!

If you tell me where I can buy a steam train up to 24" gauge that I haven't already contacted. Earliest postmark gets the reward. I pay cash, pick up and don't have to ask my wife if I can buy it.

HENRY J. McMILLAN - Galva, Ill. 61434

...from the cupola

During the past few months some questions have been raised about the EXTRA BOARD listings and the answers may prove to be interesting to many of the readers.

For one thing, the free ad does not need to be sent in with a subscription or renewal. The offer is open and encouraged during the term of your subscription or renewal so if there is something you want or need, or if you have something that you think other Live Steamers might need, make up an ad and send it in. If you want it to run for more than a month, the 5¢ per word applies, but please include your check with your order. Space for these ads is limited and they are published on a first-come-first-served basis so it is possible that your ad might not appear for a month or two after you send it in.

The free-ad offer cannot, however, be carried over from one year to the next because of the involved bookkeeping and records that would be required to substantiate "accumulated" free ads.

The EXTRA BOARD, too, must be restricted to ads of a hobby nature. If you've worked hard on some patterns or a product and want to sell a few items to realize something for your time, don't! This Live Steam hobby is growing fast and there will be need for many products and many suppliers to satisfy the varied interests of the hobbyists. Rule: Don't advertise these ventures with a space ad or a business card. The rates are reasonable and the response, we hear, is good. We're anxious, too, to help your venture along with a write-up in the NEW PRODUCTS columns if you will tell us about it.

With the inch or two left in this column we'd like to reflect again on Scotty's comment when we took over his Live Steam Newsletter a year-and-a-half ago: "Live Steamers are a wonderful bunch of guys!" We realize how right he was when we receive hundreds of Christmas greetings from Live Steamers all over the world... and when the phone rings and we find it's Dr. Hoffman down in Richmond, Illinois, taking a break during a hectic period of evening office hours to relax and tell us how much he enjoys reading LIVE STEAM... and when Martin Evans takes time out from his work on *Model Engineer* in London to respond to our request for a few words at the passing of LBSC. A very warm "Thank You" to you all!

– W. C. F. –

THE EXTRA BOARD

Items for sale or wanted to purchase by hobbyists. One free ad included with subscription, additional ads 5¢ per word with order.

WANTED

A good used 1" Live Steam engine, either 4–8–4 or 4–6–2, coal fired. If available submit full details and photo. Thomas C. Phillips, Sta. P. O. Box 588, Hapeville, Georgia 30054.

Electric trains made before 1941. Will pay top cash. Also want Buddy-L push toys. Al Staufer, Route 4, Medina, Ohio.

FOR SALE

Colored photo 10" x 20" of S. P. "DAYLIGHT" done in transparent oil color. Jack Fescu, 4309 Edenhurst Ave., Los Angeles, Calif. 90039.

3" Case steam traction engine with 2 sets of wheels – steel and rubber tired. James B. Ridenour, 130 Scenic Drive, Vinton, Iowa 52349.

3" scale EMD loco 15" gauge has hydraulic brakes, 6 HP air cooled engine, front and rear trucks alive, 1 pair extra trucks for coach. John L. Ifrebenar, Shaw Road R. D. #1, Conklin, N. Y. 13748.

Model of 1915 Case Steam Tractor, 2" Scale. Will operate on coal or bottled gas. Professionally made with industrial enamel finish. This tractor has never been run so it is not worn out. Will sell at cost of materials, $800.00. E. Nelson, 211 S. Lafayette Blvd., Warren, Michigan 48091.

"Proposed SOUTHEASTERN RAILROAD" Vol. I and II. Vol. I (56 pages, 24 pictures) tells of efforts to start a new railroad from Atlanta to Savannah, Georgia. Vol. II (80 pages, 14 color pictures, 49 b&w) tells history leading up to Budd RDC cars and dome cars plus chapter of events leading to abandonment of passenger service by West Shore Railroad. $1.00 each from E. T. Mitchell, 107 W. Circular Ave., Paoli, Pa., 19301.

1½" scale 7½" gauge 4–6–4 oil burner, 12" steel boiler, steam operated water pump and 6V generator, excellent steamer. Mr. Raymond Teerling, 15856 Via Cordoba, San Lorenzo, Calif. 94580, phone 415–276-7768.

¾" scale 4–4–0, 800 feet of steel rail on ties and 100 feet of aluminum rail on ties all for $1,200. W. K. Hayman, 3174 29th Street, Zion, Illinois 60099.

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Portsmouth, N. H., 03801

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Live Steam
MODEL ENGINEER GUILD

Post Office Box 635
Cadillac, Michigan 49601

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